



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0617/B(U)-96, REVISION 5

East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590

REVALIDATION OF CANADIAN COMPETENT AUTHORITY
CERTIFICATE CDN/2081/B(U)-96

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - MDS Nordion F-168 (1996) and F-168-X (1996), Serial Nos. 53 and up.
2. Package Description and Authorized Radioactive Contents - as described in Canada Certificate of Competent Authority CDN/2081/B(U)-96, Revision 2 (attached).
3. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
 - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
 - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

¹ "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/0617/B(U)-96, REVISION 5

- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.
4. Marking and Labeling - The package shall bear the marking USA/0617/B(U)-96 in addition to other required markings and labeling.
5. Expiration Date - This certificate expires on November 30, 2012. On March 01, 2008, this certificate supersedes all previous revisions of USA/0617/B(U)-96.

This certificate is issued in accordance with paragraph 808 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the December 04, 2007 petition by MDS Nordion, Ottawa, Ontario, and in consideration of other information on file in this Office.

Certified By:



Robert A. Richard
Deputy Associate Administrator for Hazardous Materials Safety

Jan 04 2008

(DATE)

Revision 5 - Issued to revalidate Canadian Certificate of Approval No. CDN/2081/B(U)-96, Revision 2.



Canadian Certificate No. CDN/2081/B(U)-96 (Rev. 2)	Issue Date Dec-04-2007	Expiry Date Nov-30-2012	CNSC File 30-A2-94-3
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Certificate for Transport Package Design

The transport package design identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and Section 7 of the *Packaging and Transport of Nuclear Substances Regulations*, and to the 1996 Edition (Revised) of the *IAEA Regulations for the Safe Transport of Radioactive Material*.

REGISTRATION OF USE OF PACKAGES

All users of this authorization shall register their identity in writing with the Canadian Nuclear Safety Commission prior to the first use of this authorization and shall certify that they possess the instructions necessary for preparation of the package for shipment.

PACKAGE IDENTIFICATION

Designer: **MDS Nordion**
Make/Model: **F-168 (1996) and F-168-X (1996), Serial Nos. 53 and up**
Mode of Transport: **Air, Sea, Road, Rail**

IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**CDN/2081/B(U) - 96**".

PACKAGE DESCRIPTION

The F-168 packaging, as shown on MDS Nordion Drawing Nos. F116801-001, (Rev. R) and F116801-020, (Rev. H) and the F-168-X packaging, as shown on MDS Nordion Drawing Nos. F116801-100 (Rev. F) and F116801-101 (Rev. J), consists of a 266 mm lead-filled shielding steel encased right cylinder with external fins, insulated steel flame shields on the top and side, steel covered insulation on the bottom and an optional heat screen on the top. The cavity is equipped with a drain and vent line for pool loading. The drain and vent line of the F-168-X package are sealed with a stainless steel plug. The package is permanently mounted on a structural steel base. The containment system is the source outer encapsulation. An illustration of the package is shown on attached Drawing No. F-168(-X) (1996) (Issue 2).

The configuration of the F-168 and F-168-X is as follows:

Shape: Cylinder	Shielding: Lead
Mass: 5445 kg	Outer Casing: Steel
Length: n/a	Height: 1659 mm
Width: n/a	Diameter: 1013 mm



Canadian Certificate No. CDN/2081/B(U)-96 (Rev. 2)	Issue Date Dec-04-2007	Expiry Date Nov-30-2012	CNSC File 30-A2-94-3
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AUTHORIZED RADIOACTIVE CONTENTS

See Appendix A

QUALITY ASSURANCE

Quality assurance for the design, manufacture, testing, documentation, use, maintenance and inspection of the package shall be in accordance with:

- MDS Nordion Specification No. IN/DS 1811 F-168 (2), "Design, Manufacturing and Operating Specification for F-168 and F-168-X Transport Packages"
- MDS Nordion Specification No. IN/QA 0224 Z000 (7)*, "Radioactive Material Transport Package Quality Plan"
- MDS Nordion Specification No. IN/QA 0562 A000 (4)*, "Sealed Source Quality Plan"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations
- * or latest current revision

SHIPMENT

The preparation for shipment of the package shall be in accordance with:

- MDS Nordion Specification No. IN/DS 1811 F-168 (2), "Design, Manufacturing and Operating Specification for F-168 and F-168-X Transport Packages"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations



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This certificate does not relieve the shipper from any requirement of the government of any country through or into which the package will be transported.

A. Régimbald
Designated Officer pursuant to paragraph 37(2)(a)
of the Nuclear Safety and Control Act



Appendix A

The package is authorized to contain not more than:

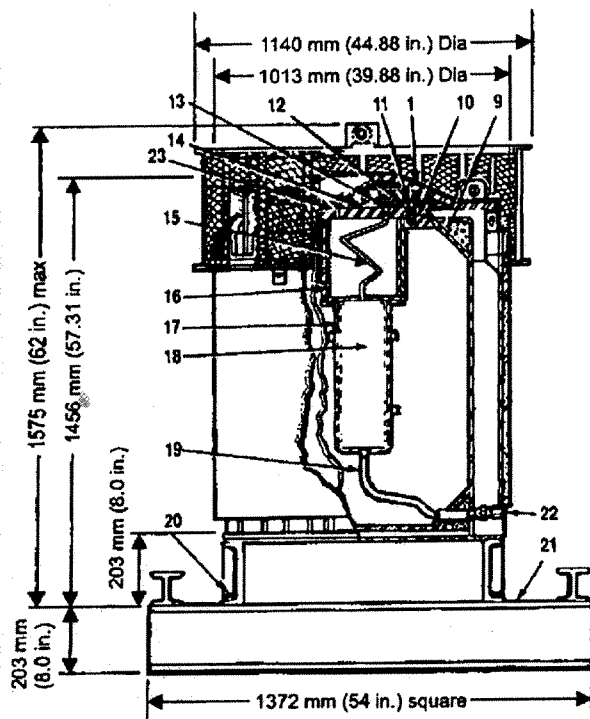
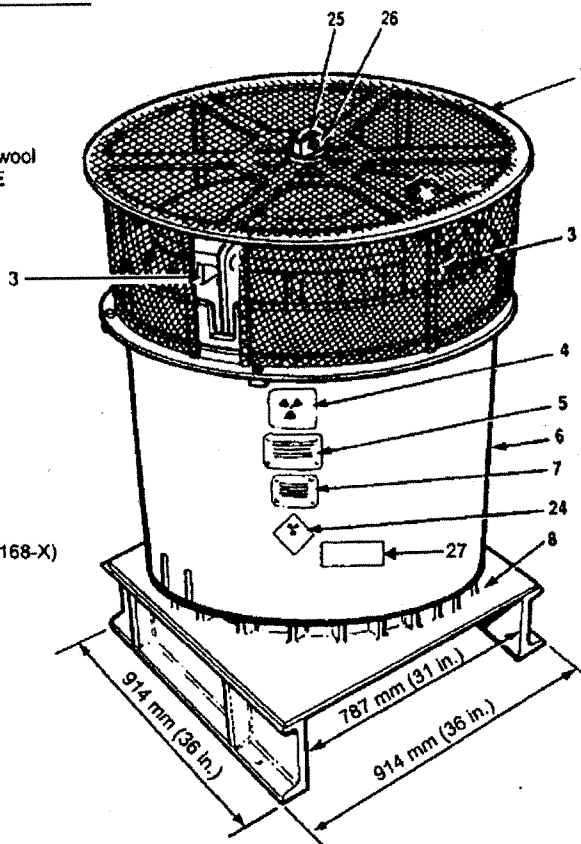
Radionuclide	Maximum Quantity (TBq)	Form	Maximum Decay Heat (W)	Sealed Capsule
Cobalt-60	7,400	Metal pellets, metal wafer, metal slug, stainless steel clad wire, aluminium clad cobalt slugs	3,200	C-132, C-133, C-146, C-151, C-177, C-185, C-188, C-189, C-190, C-198, C-199, C-200, C-238, TC-239, C-246, C-247, C-248, C-252, C-306, C-335, XC-318, XC-325, C-348, C-442, AC-191*, AC-195*, AC-345*, AC-339*, welded stainless steel capsules that meet the requirements of the International Organization of Standardization International Standard 2919 (First Edition) under classification number E53424, or special form sources similar to source models listed above, all with the capsules retained within a holder that distribute them throughout the cavity volume.
Cobalt-60	2,590	Metal slug aluminium sheathed	1,070	C-350 or special form sources similar to the source models listed above, all with the capsules retained within a holder that distribute them throughout the cavity volume.
Cobalt-60	5,550	Metal slug nickel plated	2,320	C-351 or special form sources similar to the source models listed above, all with the capsules retained within a holder that distribute them throughout the cavity volume.
Antimony-124	1,850	Cast metal	660	C-232 or special form sources similar to the source models listed above, all with the capsules retained within a holder that distribute them throughout the cavity volume.
Cesium-137	3,700	Cesium chloride	522	Special form sources with double encapsulation in stainless steel, all with the capsules retained within a holder that distribute them throughout the cavity volume.

* Transported in F-168-X only

Combination loading of the above materials is authorized provided that the sum of the ratios of loaded activity to authorized activity, for all material loaded, does not exceed 1.0.

Parts List

1. Upper Fireshield
2. Optional Heat Screen
3. Retaining Brackets (4) for Upper Fireshield
4. Radiation Caution Plate
5. MDS Nordion Identification Plate
6. Fireshield (Removable) - O.D. 1013 mm (39.88 in.), Laminated Construction: 2 x 6.3 mm (0.25 in.) Steel + 25.4 mm (1 in.) Kaowool
7. Warning Plate "CAUTION - HEAT EMITTER - DO NOT STORE IN INSULATED OR REFRIGERATION CONTAINER OR INSULATED SPACE"
8. Ceramic insulation - Steel Encased
9. Vermiculite Packing
10. Gasket (Neoprene)
11. 7/8 - 9 Hex Bolt (8)
12. Wire Seal
13. 3/8 in. NPT Pipe Plug (2)
14. Plug Lift Lug
15. Vent Tube
16. Plug
17. Cavity: 479 mm x 162 mm Dia. (18.87 in. x 6.37 in. Dia.)
18. Radioactive Contents and Carrier
19. Drain Tube (sealed at cavity for F-168-X)
20. 3/4 -10 Hex Bolt for Skid (4)
21. Optional Removable Shipping Skid, 54 in. (1370 mm) square
22. Nipple and Drainline Cap (sealed with standard pipe plug for F-168-X)
23. Shield Plate with 3/8 -16 Screws (3)
24. Category Label (2)
25. Eye Bolt
26. Eye Bolt Cover
27. UN Number Label (2)



Notes

1. CNSC Certificate CDN/2081/B(U)-96
2. Meets IAEA Type B(U) Requirements
3. Steel encased lead shielding: 266 mm (10.5 in.)
4. Gross Weight: 5445 kg (12,000 lb.)
5. Plug Weight: 177 kg (390 lb.)
6. Projected Floor Loading: 2900 kg/m² (593 lb/ft²)
7. Radionuclides carried:
 1. Cobalt-60
 2. Antimony-124
 3. Cesium-137
8. Labels may be positioned as illustrated, or 45° to that shown

MDS Nordion

447 March Road, P.O. Box 13500
Kanata, Ontario, Canada, K2K 1X8
Tel: (613) 592-2790 - Fax: (613) 592-6937

THIS DRAWING IS THE PROPERTY OF MDS NORDION AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF MDS NORDION.

TITLE

**F-168 and F-168-X Transport Package
(To IAEA 1996 Transport Regulations)**

REF. IN/SS 1812 F168X
F116801-001/F116801-020

REVISED Nov 02

DCN A2119-D-08A

DATE Nov 2001

No.

F-168(-X) (1996)

ISSUE

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APPROVED
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SHEET 1 OF 2



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1200 New Jersey Avenue SE
Washington, D.C. 20590

CERTIFICATE NUMBER: USA/0617/B(U)-96, Revision 5

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